

REMARKS

The Examiner has rejected Claims 2-12, 15 and 17-22 under 35 U.S.C 103(a) as being unpatentable over German patent No. 4,419,065 ("DE '065") in view of U.S. Patent No. 5,051,020 to Schleicher ("Schleicher"). In response, Applicant has amended independent claims 17 and 22 to more clearly recite that the deformation of all of the superimposed sheets occurs into an annular recess in the die. In addition, independent claims 17 and 22 have been amended to more clearly recite that the superimposed sheets are deformed out of the planes defined by the interfaces between them. Applicant respectfully submits that amended claims 17 and 22, and the claims which are dependent thereon are patentable over the cited references.

The examiner has admitted that DE '065 does not disclose deforming all of the sheets out of their planes into an annular recess (see the first full paragraph on page 3 of the office action) but does argue that this document illustrates an annular recess (not labeled) in figure 1a that is immediately adjacent to the die cavity in which is delineated from the cavity by virtue of the edge 12. The examiner attempts to use Schleicher to provide the missing feature and argues that in figures 31 to 34 there is disclosure of the sheets being deformed out of their planes and into an annular recess. The applicant respectfully disagrees with this point.

The embodiment of figures 31 to 34 of Schleicher shows a first die 282 with a coining face 290 that extends circumaxially about a die cavity 292 (see column 8, lines 50-57). A second die 302 and punch 296 are moveable downwards towards the first die. The second die 302 has a coining face 304 which is opposed and axially aligned to the first coining face 290 (see column 8, final paragraph). In operation, the punch 296 and second die 302 are moved relative to the

first die on which the sheets to be joined are supported. This results in simultaneous drawing of a pair of cup shaped cavities in the sheets (see figure 32). It is stated in column 9, lines 12 to 14 that these cavities are "nested one within the other and deformed out of the plane of the sheets". It is to be noted that this deformation of the sheets out of their planes is referring to the deformation of the sheets into the die cavity 292 of the first die by virtue of the action of the punch 296 and not to deformation outside the cavity. After the sheets have been drawn into the cavity in this way the punch is retracted as shown in figure 33 and the first and second dies 282, 284 are then axially squeezed together (see figure 34) to effect "pinching the outboard region of the sheets circumaxially surrounding the cavity periphery between the first and second coining faces radially inwardly deforming the sheet material causing the cavity peripheries and adjoining walls to permanently deform inwardly" (see column 9, lines 25 to 31). On a simple visual comparison of figure 33 and 34 it can be seen that the two coining faces 292 and 304 have "squeezed" the metal sheets together in the region around the interlocked cavities that were formed in the sheets by the punch. In this region the sheets cannot be said to have been deformed out of their planes they still occupy the same general plane although their surfaces have been indented by virtue of the coining operation. In addition to this it cannot be said that the sheets in this region have been deformed into an annular recess. No such annular recess is illustrated. The sheets have been "squeezed" together by protruding coining faces but there is no deformation into a recess. In the region radially outboard of the coining faces the sheets remain un-deformed and cannot therefore be said to have been deformed out of their planes and into an annular recess. Thus it is respectfully submitted that Schleicher does not teach deforming both sheets out of their planes into an annular recess surrounding the cavity. The only deformation of

sheets out of their planes is into the die cavity. If the coining operation can be described as deforming the metal sheets out of their planes (and this is contested) then there is no indication that the sheets are deformed into an annular recess. No such annular recess is shown in the area of deformation.

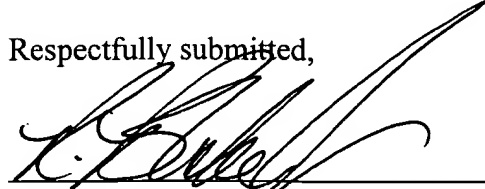
If the skilled person were to combine the disclosures of DE '065 and Schleicher he would not arrive at the solution of the present invention. DE '065 discloses piercing of a thin bottom sheet in a thick/thin sheet combination by using an edge of a die cavity. In contrast, Schleicher describes using coining rings to squeeze sheets together in a region around the die cavity after the joint has been formed by the punch. Neither document discloses deforming sheets into an annular recess outside of the die cavity such that those sheets are deformed out of their planes.

The amendments of independent claims 17 and 22 that the "planes" are defined by the interfaces between the superimposed sheets further distinguishes these claims, and the claims which are dependent thereon, from Schleicher. With reference to figure 34 of Schleicher, the horizontal line representing the interface between the sheets 286 and 288 in the region outside of the die cavity remains undisturbed. This is in contrast to the deformation of the planes of claims 17 and 22 into the annular recess surrounding the die cavity. DE '065 adds nothing to overcome this shortcoming of Schleicher.

In view of the foregoing amendments and remarks, it is believed that the application is now in condition for allowance and such action is respectfully requested.

If the Examiner believes that a telephone conference would advance the prosecution of this case, it is requested that the undersigned attorney be contacted for that purpose.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "R. Blake Johnston", is written over a horizontal line.

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3/16/04

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